IN THE CLAIMS:

1. (Currently amended) A method for managing data elements in bi-directionally growable data structure, the method comprising:

responsive to an indication that a data element is to be placed into the data structure:

advancing a head pointer one memory location in a direction indicated by a state of a direction flag; and

placing a new data element into the memory location indicated by the head pointer;

swapping the position of the head pointer and a base pointer; and

reversing the state of the direction flag to indicate growth in the opposite direction in preparation for receiving another data element.

2. (Canceled)

3. (Original) The method as recited in claim 1, further comprising:

responsive to an indication that a data element is to be removed from the data structure:

swapping the head and the base pointers;

reversing the state of the direction flag; and

removing the data element from the memory location indicated by the head pointer.

4. (Original) The method as recited in claim 3, further comprising:

moving the head pointer by one memory location in a direction opposite a direction indicated by the state of the direction flag.

5. (Original) The method as recited in claim 1, wherein the data structure is a first in last out data structure.

6. (Original) The method as recited in claim 1, wherein the data structure is a stack data structure.

7. (Currently amended) A computer program product in a computer readable media for use in a data processing system for managing data elements in bi-directionally growable data structure, the computer program product comprising:

first instructions, responsive to an indication that a data element is to be placed into the data structure:

for advancing a head pointer one memory location in a direction indicated by a state of a direction flag; and

for placing a new data element into the memory location indicated by the head pointer;

second instructions for swapping the position of the head pointer and a base pointer; and

third instructions for reversing the state of the direction flag to indicate growth in the opposite direction in preparation for receiving another data element.

8. (Canceled)

9. (Original) The computer program product as recited in claim 7, further comprising:

second instructions, responsive to an indication that a data element is to be removed from the data structure:

for swapping the head and the base pointers;

for reversing the state of the direction flag; and

for removing the data element from the memory location indicated by the head pointer.

10. (Original) The computer program product as recited in claim 9, further comprising:

third instructions for moving the head pointer by one memory location in a direction opposite a direction indicated by the state of the direction flag.

11. (Original) The computer program product as recited in claim 7, wherein the data structure is a first in last out data structure.

12. (Original) The computer program product as recited in claim 7, wherein the data structure is a stack data structure.

13. (Currently amended) A system for managing data elements in bi-directionally growable data structure, the system comprising:

first means, responsive to an indication that a data element is to be placed into the data structure:

for advancing a head pointer one memory location in a direction indicated by a state of a direction flag; and

for placing a new data element into the memory location indicated by the head pointer;

second means for swapping the position of the head pointer and a base pointer; and

third means for reversing the state of the direction flag to indicate growth in the opposite direction in preparation for receiving another data element.

14. (Canceled)

15. (Original) The system as recited in claim 13, further comprising:

second means, responsive to an indication that a data element is to be removed from the data structure:

for swapping the head and the base pointers;

for reversing the state of the direction flag; and

for removing the data element from the memory location indicated by the head pointer.

16. (Original) The system as recited in claim 15, further comprising:

third means for moving the head pointer by one memory location in a direction opposite a direction indicated by the state of the direction flag.

17. (Original) The system as recited in claim 13, wherein the data structure is a first in last out data structure.

18. (Original) The system as recited in claim 13, wherein the data structure is a stack data structure.

19. (Currently amended) A data processing system, comprising:

a processor; and

a memory; wherein

the memory comprises a bi-directionally growing stack, wherein the bi-directionally growing stack comprises at least one of a dead element stack and a used element stack.

20-21. (Canceled)

22. (Original) A memory system, comprising:

a linear memory array; and

a stack stored in said linear memory array;

wherein as elements are added to the stack, each of the added elements is placed into a next empty memory location at an opposite end of the stack from the end of the stack that a previously added element was placed.

23. (Original) The memory system as recited in claim 22, wherein the stack is a dead element stack.

24. (Original) The memory system as recited in claim 22, wherein the stack is a used element stack.

25. (Original) The memory system as recited in claim 22, wherein as elements are removed from the stack, a next element removed is removed from a memory location at an opposite end of the stack from a location of a previously removed element.